AUG 0 1 2005

# TRANSMITTAL OF APPEAL BRIEF (Large Entity)

Docket No. POU920000018US1

In Re Application Of: **Uceda-Sosa et al.**

| Application No. | Filing Date | Examiner | Customer No. | Group Art Unit | Confirmation No. |
|---|---|---|---|---|---|
| 09/583,797 | 05/31/2000 | Lillian Vo | 46369 | 2195 | 9330 |

Invention: **METHOD, SYSTEM AND PROGRAM PRODUCTS FOR EFFICIENTLY LOCKING RESOURCES OF A GLOBAL DATA REPOSITORY**

COMMISSIONER FOR PATENTS:

Transmitted herewith ~~is~~ is the Appeal Brief in this application, with respect to the Notice of Appeal filed on **May 31, 2005**

The fee for filing this Appeal Brief is: **$500.00**

- ☐ A check in the amount of the fee is enclosed.
- ☐ The Director has already been authorized to charge fees in this application to a Deposit Account.
- ☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. **09-0463 (IBM)**
- ☐ Payment by credit card. Form PTO-2038 is attached.

**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

Blanche E. Schiller
*Signature*

Dated: **July 29, 2005**

**Blanche E. Schiller, Esq.**
**Reg. No. 35,670**
**Heslin Rothenberg Farley & Mesiti P.C.**
**5 Columbia Circle**
**Albany, NY 12203**
**Telephone: (518) 452-5600**
**Facsimile: (518) 452-5579**

cc:

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)] on

July 29, 2005
*(Date)*

Jill K. Becker
*Signature of Person Mailing Correspondence*

**Jill K. Becker**
*Typed or Printed Name of Person Mailing Correspondence*

OIPE
AUG 0 1 2005
PATENT & TRADEMARK OFFICE

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**
**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

| | | |
|---|---|---|
| Appellants: | Uceda-Sosa et al. | Group Art Unit: 2195 |
| Serial No.: | 09/583,797 | Examiner: Lillian Vo |
| Filed: | May 31, 2000 | Appeal No.: |
| Title: | METHOD, SYSTEM AND PROGRAM PRODUCTS FOR EFFICIENTLY LOCKING RESOURCES OF A GLOBAL DATA REPOSITORY | |

**Certificate of Mailing**

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as first class mail in an envelope addressed to: Mail Stop Appeal Briefs – Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on July 29, 2005.

08/02/2005 SHASSEN1 00000006 090463 09583797
01 FC:1402 500.00 DA

Jill K. Becker

Date of Signature: July 29, 2005.

Mail Stop Appeal Briefs – Patents
Commissioner for Patents
P.O. Box 1450, Alexandria, VA 22313-1450

**Brief of Appellants**

Dear Sir:

This is an appeal from a final rejection, mailed January 26, 2005, rejecting claims 1-48 of the above-identified application. The Appeal Brief is due within two months from the date the Notice of Appeal was received at the United States Patent and Trademark Office. Since appellants' postcard indicates that the Notice of Appeal was received on May 31, 2005, this Brief is initially due on or before July 31, 2005. Therefore, this Brief is timely filed. The Brief is accompanied by a transmittal letter authorizing the charging of appellants' deposit account for payment of the requisite fee set forth in 37 C.F.R. §1.11(c).

Appellants' Brief is being filed after the effective date of the final BPAI Rules, September 13, 2004, and, therefore, the format and content of appellants' Brief is in compliance with the requirements set forth in 37 CFR §41.37(c). If appellants' Brief does not comply with the requirements set forth in 37 CFR §41.37(c), appellants request notification of the reasons for noncompliance and the opportunity to file an amended brief pursuant to 37 CFR §41.37(d).

## Real Party in Interest

This application is assigned to International Business Machines Corporation by virtue of an assignment executed by the co-inventors and recorded with the United States Patent and Trademark Office at reel 011222, frame 0625, on September 25, 2000. Therefore, the real party in interest is International Business Machines Corporation.

## Related Appeals and Interferences

To the knowledge of the appellants, appellants' undersigned legal representative, and the assignee, there are no other appeals or interferences, which will directly affect or be directly affected by or have a bearing on the Board's decision in the instant appeal.

## Status of Claims

The application was filed on May 31, 2000 with the U.S. Patent and Trademark Office. As filed, the application included nine claims, of which three were independent claims (e.g., claims 1, 4 and 7). A Preliminary Amendment was filed on April 12, 2002 adding new dependent claims 10-48.

In an initial Office Action, dated November 4, 2003, claims 1-48 were rejected. In particular, claims 19, 20, 32, 33 and 45-46 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regarded as the invention; claims 1, 4 and 7 were rejected under 35 U.S.C.

102(e) as being anticipated by Leff et al. (U.S. Patent No. 6,275,863); claims 1-9, 10, 22, 23, 35, 36 and 48 were rejected under 35 U.S.C. 102(e) as being anticipated by Soltis et al. (U.S. Patent No. 6,493,804); claims 11-14, 24-27 and 37-40 were rejected under 35 U.S.C. 103(a) as being unpatentable over Soltis et al. in view of Shaughnessy (U.S. Patent No. 5,555,388); and claims 15-21, 28-34 and 41-47 were rejected under 35 U.S.C. 103(a) as being unpatentable over Soltis et al. in view of Annevelink (U.S. Patent No. 5,448,727). A Response to Office Action was filed on February 9, 2004 with a one-month request for extension of time, in which claims 19, 20, 32, 33 and 45-46 were amended.

On April 21, 2004, another non-final Office Action was issued citing new grounds of rejection. In particular, claims 1, 4 and 7 were rejected under 35 U.S.C. 102(b) as being anticipated by NEC Corporation (JP 07200321 A); claims 1-10, 21-23, 34, 35, 36, 47 and 48 were rejected under 35 U.S.C. 103(a) as being unpatentable over Soltis et al. (U.S. Patent No. 6,493,804) in view of Huber (U.S. Patent No. 5,802,514); claims 11-14, 24-27 and 37-40 were rejected under 35 U.S.C. 103(a) as being unpatentable over Soltis in view of Huber and further in view Shaughnessy (U.S. Patent No. 5,555,388); and claims 15-20, 28-33 and 41-46 were rejected under 35 U.S.C. 103(a) as being unpatentable over Soltis in view of Huber and further in view of Annevelink (U.S. Patent No. 5,448,727). Appellants filed a Response to Office Action on August 20, 2004, with a request for extension of time. In this Response, appellants amended independent claims 1, 4 and 7.

On January 26, 2004, a Final Office Action was issued citing new art. In particular, now claims 1-10, 21-23, 34, 35, 36, 47 and 48 were rejected under 35 U.S.C. 103(a) as being unpatentable over Cheng (U.S. Patent No. 6,067,548) in view of Soltis et al. (U.S. Patent No. 6,493,804); claims 11-14, 24-27 and 37-40 were rejected under 35 U.S.C. 103(a) as being unpatentable over Cheng in view of Soltis and further in view of Shaughnessy (U.S. Patent No. 5,555,388); and claims 15-20, 28-33 and 41-46 were rejected under 35 U.S.C. 103(a) as being unpatentable over Cheng in view of Soltis and further in view of Annevelink (U.S. Patent No.

5,448,727). Appellants filed a Response to Final Office Action on March 22, 2005, in which no claims were amended.

Appellants received an Advisory Action, dated April 21, 2005, which indicated that the proposed amendments (which were to the specification and not to the claims) will be entered and that the request for reconsideration has been considered but does not place the application in condition for allowance. A Notice of Appeal to the Board of Patent Appeals and Interferences was filed on May 26, 2005, accompanied by a one-month extension of time request, and received at the United States Patent and Trademark Office on May 31, 2005.

The status of the claims is as follows:

Claims allowed – None;

Claims objected to – None;

Claims rejected – 1-48; and

Claims cancelled – None.

Appellants are appealing the rejection of claims 1-48.

## Status of Amendments

Appellants' remarks proffered in the Response to the final Office Action, dated January 26, 2005, were considered. However, no claim amendment was effectuated by the Response. The claims as set out in Appendix A include all prior amendments.

## Summary of Claimed Subject Matter

In one aspect of the invention, appellants claim a method (e.g., independent claim 1) of managing the locking of resources of a data repository (see, e.g., p. 4, lines 18-22 of appellants'

specification). The method includes, for instance, determining whether a relationship between one resource and another resource of a data repository is a containment-based relationship or whether the relationship is a reference-based relationship (see, e.g., p. 13, lines 5-10; FIG. 5), wherein the data repository comprises a hierarchical structure of a plurality of resources (see, e.g., p. 7, lines 18-20; FIGs. 3-4), said hierarchical structure comprising one or more resources having a reference-based relationship and one or more resources having a containment-based relationship (see, e.g., p. 8 lines 25-27; p. 10, lines 1-6; p. 12, lines 22-29; FIG. 4); and locking at least one resource of the plurality of resources using a locking strategy that depends on whether the determined relationship is a containment-based relationship or a reference-based relationship (see, e.g., p. 13, lines 5-10; FIG. 5).

In a further aspect of the present invention, appellants claim a system (e.g., independent claim 4) of managing the locking of resources of a data repository (see, e.g., p. 4, lines 18-22). The system includes, for instance, means for determining whether the relationship between one resource and another resource of a data repository is a containment-based relationship or whether the relationship is a reference-based relationship (see, e.g., p. 13, lines 5-10; FIG. 5), wherein the data repository comprises a hierarchical structure of a plurality of resources (see, e.g., p. 7, lines 18-20; FIGs. 3-4), said hierarchical structure comprising one or more resources having a reference-based relationship and one or more resources having a containment-based relationship (see, e.g., p. 8, lines 25-27; p. 10, lines 1-6; p. 12, lines 22-29; FIG. 4); and means for locking at least one resource of the plurality of resources using a locking strategy that depends on whether the determined relationship is a containment-based relationship or a reference-based relationship (see, e.g., p. 13, lines 5-10; FIG. 5). As described in the specification, in one example, a repository server performs the determining and locking functions of the claimed means for elements, as described, for instance, on p. 7, lines 20-25 and p. 16, lines 3-5 (see, also, FIGs. 1 and 2).

In yet a further aspect of the invention, appellants claim at least one program storage device readable by a machine, tangibly embodying at least one program of instructions

executable by the machine (e.g., independent claim 7) to perform a method of managing the locking of resources of a data repository (see, e.g., p. 4, lines 18-22; p. 17, lines 1-4 of appellants' specification). The method includes, for instance, determining whether a relationship between one resource and another resource of a data repository is a containment-based relationship or whether the relationship is a reference-based relationship (see, e.g., p. 13, lines 5-10; FIG. 5), wherein the data repository comprises a hierarchical structure of a plurality of resources (see, e.g., p. 7, lines 18-20; FIGs. 3-4), said hierarchical structure comprising one or more resources having a reference-based relationship and one or more resources having a containment-based relationship (see, e.g., p. 8 lines 25-27; p. 10, lines 1-6; p. 12, lines 22-29; FIG. 4); and locking at least one resource of the plurality of resources using a locking strategy that depends on whether the determined relationship is a containment-based relationship or a reference-based relationship (see, e.g., p. 13, lines 5-10; FIG. 5).

## Grounds of Rejection to Be Reviewed On Appeal

1. Claims 1-10, 21-23, 34, 35, 36, 47 and 48 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Cheng (U.S. Patent No. 6,067,548) in view of Soltis et al. (U.S. Patent No. 6,493,804);

2. Claims 11-14, 24-27 and 37-40 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Cheng in view of Soltis and further in view of Shaughnessy (U.S. Patent No. 5,555,388); and

3. Claims 15-20, 28-33 and 41-46 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Cheng in view of Soltis and further in view of Annevelink (U.S. Patent No. 5,448,727).

## Argument

### I. Rejection under 35 U.S.C. 103(a) over U.S. Patent No. 6,067,548 to Cheng in view of U.S. Patent No. 6,493,804 to Soltis

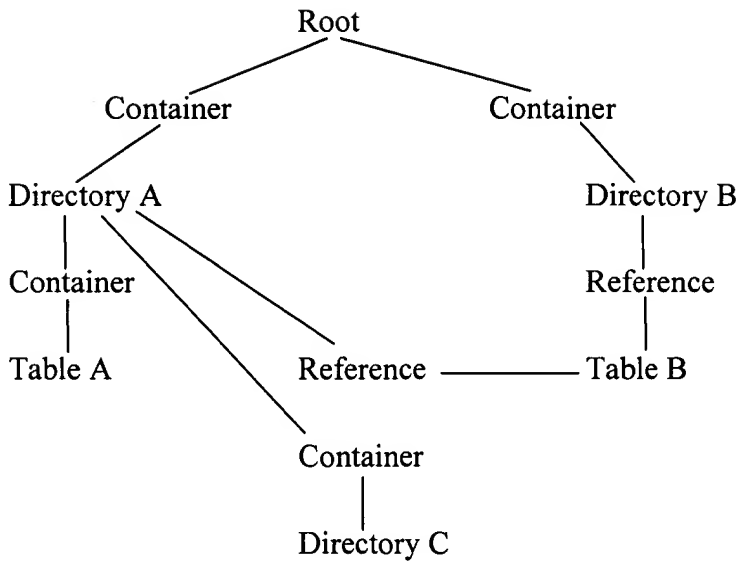
#### A. Claims 1-10, 21-23, 34, 35, 36, 47 and 48:

Claims 1-10, 21-23, 34-36, 47 and 48 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Cheng (U.S. Patent No. 6,067,548) in view of Soltis et al. (U.S. Patent No. 6,493,804). Appellants respectfully submit that the rejection of these claims is erroneous and respectfully request reversal of this rejection for at least the reasons below.

##### 1. Independent claims 1, 4 and 7:

In one aspect, appellants' invention is directed to the efficient locking of resources of a global data repository. A locking facility is provided that enables concurrent access to a complex data structure, while minimizing the lock acquisition necessary to access a particular resource of that complex data structure. As one example, the complex data structure is a data repository that includes a plurality of resources (e.g., tables, directories). The repository has a hierarchical topology, and there are various relationships among the resources of the repository and the locks of the repository. As examples, the relationships of the resources may include containment-based relationships and reference-based relationships.

One example of such a repository is depicted in FIG. 4 of appellants' application and reproduced below for convenience.




The type of locking relationship that exists depends on the particular relationship between the resources. For example, if the relationship between the resources is a containment-based relationship, then the locking acquisition is referred to as chained locking. On the other hand, if the relationship is a reference-based relationship, then the locking acquisition is referred to as a reference-based locking strategy.

To minimize the locking needed, the locking strategy selected for a particular resource depends on the relationship between that resource and at least one other resource. For example, if Table A is to be locked, and since Table A has a containment-based relationship, a chained locking acquisition is used. In contrast, if Table B is to be locked, and since Table B has a reference-based relationship, then a reference-based locking strategy is used, as one example.

In one particular embodiment, appellants claim a method of managing the locking of resources of a data repository (e.g., independent claim 1). The method includes, for instance, determining whether a relationship between one resource and another resource of a data repository is a containment-based relationship or whether the relationship is a reference-based relationship, wherein the data repository comprises a hierarchical structure of a plurality of

resources, the hierarchical structure comprising one or more resources having a reference-based relationship and one or more resources having a containment-based relationship; and locking at least one resource of the plurality of resources using a locking strategy that depends on whether the determined relationship is a containment-based relationship or a reference-based relationship. Thus, in one aspect of appellants' claimed invention, a determination is made as to the relationship of a resource, and a locking strategy is employed that depends on whether that relationship is a containment-based or a reference-based relationship. This is very different from the teachings of the references, either alone or in combination.

For example, while Cheng describes an organizational database and relationship definitions, there is no description, teaching or suggestion in Cheng of locking. Further, there is no description, teaching or suggestion in Cheng of determining whether a relationship between one resource and another resource is a containment-based relationship or a reference-based relationship and then locking a resource based on that determined relationship. This is missing from Cheng, as explicitly admitted in the Final Office Action (see, e.g., paragraph 1, page 3 of the Office Action). Thus, Soltis is relied upon.

However, Soltis also fails to describe, teach or suggest appellants' claimed element of determining whether a relationship between one resource and another resource of a data repository is a containment-based relationship or whether the relationship is a reference-based relationship and locking a resource using a locking strategy that depends on the determined relationship. Soltis fails to mention different types of relationships and does not differentiate between different types of relationships. There is no discussion in Soltis of whether a relationship is a containment-based relationship or a reference-based relationship. This is not discussed in Soltis. Thus, Soltis does not make any determination as to the type of relationship.

Since Soltis fails to teach or suggest determining whether a resource has a containment-based relationship or a reference-based relationship, it follows that Soltis does not teach or suggest locking the resource using a locking strategy that depends on whether the determined relationship is a containment-based relationship or a reference-based relationship. There is no

analysis in Soltis of determining the type of relationship of a resource to be locked (i.e., whether it is containment-based or whether it is reference-based), and then selecting the locking strategy based on that determination. Soltis does not even mention containment-based relationships or reference-based relationships, much less make any decisions based on such relationships. Thus, appellants respectfully submit that Soltis does not teach or suggest one or more aspects of appellants' claimed invention.

Since neither Cheng nor Soltis describes, teaches or suggests at least appellants' claimed element of locking a resource using a locking strategy based on a determination of whether a containment-based relationship or a reference-based relationship exists, the combination also fails to teach or suggest this claimed element. Neither Cheng nor Soltis makes any mention of locking a resource using a locking strategy that depends upon whether a determined relationship is a containment-based relationship or a reference-based relationship. This is missing from both references, and therefore, from the combination, as well.

Appellants respectfully submit that, at most, the combination of Cheng and Soltis (assuming arguendo the combination is proper) teaches an organizational database and relationship definitions (Cheng); and acquiring locks for shared or exclusive use of resources (Soltis). However, there is no teaching or suggestion in the combination of selecting a locking strategy based on whether a relationship between resources in a hierarchical data repository is determined to be a containment-based relationship or a reference-based relationship, as claimed by appellants. To indicate that this is taught or suggested by the combination is hindsight reconstruction of appellants' claimed invention. For at least these reasons, appellants respectfully request reversal of the rejection of independent claim 1.

Moreover, appellants respectfully submit that the combination of Cheng and Soltis is improper. For example, there is no teaching or suggestion in the references themselves to make the combination or modification suggested in the Office Action. It is well known that:

> It is insufficient to establish obviousness that the separate elements of the invention existed in the prior art; absent some teaching or suggestion, in the prior art, to combine the elements. Arkie Loures Inc. v. Gene Lareau Tackle Inc., 43 USPQ 2d 1294, 1297 (Fed. Circ. 1997)

Justification for the combination is stated in the Final Office Action, as follows:

> It would have been obvious for one of ordinary skill in the art, at the time the invention was made, to incorporate the concept of locking the resources from Soltis to Cheng ... (page 4 of Final Office Action).

Again, appellants respectfully submit that the above justification does not indicate where the references expressly teach the combination. There is no teaching in the justification or in Soltis of using a locking strategy to lock a resource in which that locking strategy depends on whether a relationship between resources of a data repository is determined to be a containment-based relationship or a reference-based relationship. Further, Cheng makes no mention of locking or of using a locking strategy that depends on whether a determined relationship is containment-based or reference-based. Thus, the references themselves do not teach or suggest the combination.

Based on the foregoing, appellants respectfully submit that the combination of Cheng and Soltis is improper, and even if proper, the combination does not teach or suggest at least appellants' claimed element of locking at least one resource of the plurality of resources using a locking strategy that depends on whether the determined relationship between resources of a hierarchical data repository that includes resources having both containment-based and reference-based relationships is a containment-based or a reference-based relationship. Thus, appellants respectfully submit that the rejection of independent claim 1 is improper.

Moreover, for similar reasons, appellants respectfully submit that the rejection of independent claims 4 and 7 is also improper.

2. Dependent claims 2-3, 5-6, 8-10, 21-23, 34-36 and 47-48:

The dependent claims are patentable for the same reasons as the independent claims, as well as for their own additional features. For at least the reasons described above with reference to the independent claims from which these claims depend, appellants respectfully request reversal of the rejection of these claims.

## II. Rejection under 35 U.S.C. 103(a) over U.S. Patent No. 6,067,548 to Cheng in view of U.S. Patent No. 6,493,804 to Soltis and further in view of U.S. Patent No. 5,555,388 to Shaughnessy

Dependent claims 11-14, 24-27 and 37-40 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Cheng in view of Soltis and further in view of Shaughnessy. Appellants respectfully submit that the rejection of these claims is erroneous and respectfully request reversal of this rejection for at least the reasons below.

As described above, Cheng and Soltis, either alone or in combination, fail to describe, teach or suggest appellants' claimed invention, as recited in the independent claims from which these claims depend. For example, appellants respectfully submit that the combination of Cheng and Soltis (assuming arguendo the combination is proper) fails to describe, teach or suggest at least appellants' claimed element of determining whether a relationship between one resource and another resource of a hierarchical data repository is a containment-based relationship or a referenced-based relationship and then locking a resource using a locking strategy that depends on whether that determined relationship is a containment-based or a reference-based relationship. This is not taught or suggested by the combination. Further, as described above, appellants respectfully submit that the combination is improper.

Moreover, appellants respectfully submit that Shaughnessy does not overcome the deficiencies of Cheng and Soltis. Although Shaughnessy describes locking, Shaughnessy does not describe, teach or suggest at least appellants' claimed element of determining whether a

relationship between one resource and another resource of a data repository is a containment-based relationship or a reference-based relationship and locking at least one resource of a plurality of resources using a locking strategy that depends on whether the determined relationship is a containment-based relationship or a reference-based relationship. Since each of the applied references fails to describe, teach or suggest at least this claimed element, appellants respectfully submit that the combination (assuming arguendo it is proper) also fails to describe, teach or suggest this claimed element. Therefore, appellants respectfully request reversal of the rejection of the dependent claims.

Further, appellants respectfully submit that for similar reasons as above, the combination is improper. For instance, there is no teaching or suggestion in the references to make the combination or modification.

For at least these reasons, appellants respectfully request reversal of the §103 rejection.

**III. Rejection under 35 U.S.C. 103(a) over U.S. Patent No. 6,067,548 to Cheng in view of U.S. Patent No. 6,493,804 to Soltis and further in view of U.S. Patent No. 5,448,727 to Annevelink**

Dependent claims 15-20, 28-33 and 41-46 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Cheng in view of Soltis and further in view of Annevelink. Appellants respectfully submit that the rejection of these claims is erroneous and respectfully request reversal of this rejection for at least the reasons below.

As described above, Cheng and Soltis, either alone or in combination, fails to describe, teach or suggest appellants' claimed invention, as recited in the independent claims from which these claims depend. For example, appellants respectfully submit that the combination of Cheng and Soltis (assuming arguendo the combination is proper) fails to describe, teach or suggest at least appellants' claimed element of determining whether a relationship between one resource and another resource of a hierarchical data repository is a containment-based relationship or a referenced-based relationship and then locking a resource using a locking strategy that depends

on whether that determined relationship is a containment-based or a reference-based relationship. This is not taught or suggested by the combination of Cheng and Soltis. Further, as described above, appellants respectfully submit that the combination is improper.

Moreover, appellants respectfully submit that Annevelink does not overcome the deficiencies of Cheng and Soltis. Annevelink describes domain based partitioning and locking within a domain, but does not describe, teach or suggest at least appellants' claimed element of determining whether a relationship between one resource and another resource of a data repository is a containment-based relationship or a reference-based relationship and locking at least one resource of a plurality of resources using a locking strategy that depends on whether the determined relationship is a containment-based relationship or a reference-based relationship. Since each of the applied references fails to describe, teach or suggest at least this claimed element, appellants respectfully submit that the combination (assuming arguendo it is proper) also fails to describe, teach or suggest this claimed element. Therefore, appellants respectfully request reversal of the rejection of the dependent claims.

Further, appellants respectfully submit that for similar reasons as above, the combination is improper. For instance, there is no teaching or suggestion in the references to make the combination or modification.

For at least these reasons, appellants respectfully request reversal of the §103 rejection.

## Conclusion

Appellants respectfully request reversal of the Section 103(a) rejections of claims 1-48, as set forth in the Final Office Action. Appellants respectfully submit that their claimed invention is not obvious over Cheng in view of Soltis, nor in view of Shaughnessy, nor Annevelink.

For all of the above reasons, appellants' allege error in rejecting their claims as obvious over the applied art. Accordingly, reversal of all rejections is respectfully requested.

Blanche E. Schiller

Blanche E. Schiller
Attorney for Appellants
Registration No.: 35,670

Dated: July 29, 2005

HESLIN ROTHENBERG FARLEY & MESITI P.C.
5 Columbia Circle
Albany, New York 12203-5160
Telephone: (518) 452-5600
Facsimile: (518) 452-5579

## Appendix A

1. A method of managing the locking of resources of a data repository, said method comprising:

determining whether a relationship between one resource and another resource of a data repository is a containment-based relationship or whether the relationship is a reference-based relationship, wherein the data repository comprises a hierarchical structure of a plurality of resources, said hierarchical structure comprising one or more resources having a reference-based relationship and one or more resources having a containment-based relationship; and

locking at least one resource of said plurality of resources using a locking strategy that depends on whether the determined relationship is a containment-based relationship or a reference-based relationship.

2. The method of claim 1, wherein said locking of said at least one resource is performed without locking at least one other resource of said plurality of resources.

3. The method of claim 1, wherein said locking of said at least one resource is further based on an operation to be performed.

4. A system of managing the locking of resources of a data repository, said system comprising:

means for determining whether a relationship between one resource and another resource of a data repository is a containment-based relationship or whether the relationship is a reference-based relationship, wherein the data repository comprises a hierarchical structure of a plurality of resources, said hierarchical structure comprising

one or more resources having a reference-based relationship and one or more resources having a containment-based relationship; and

means for locking at least one resource of said plurality of resources using a locking strategy that depends on whether the determined relationship is a containment-based relationship or a reference-based relationship.

5. The system of claim 4, wherein said means for locking comprises means for locking said at least one resource without locking at least one other resource of said plurality of resources.

6. The system of claim 4, wherein said means for locking further comprises means for locking said at least one resource based on an operation to be performed.

7. At least one program storage device readable by a machine, tangibly embodying at least one program of instructions executable by the machine to perform a method of managing the locking of resources of a data repository, said method comprising:

determining whether a relationship between one resource and another resource of a data repository is a containment-based relationship or whether the relationship is a reference-based relationship, wherein the data repository comprises a hierarchical structure of a plurality of resources, said hierarchical structure comprising one or more resources having a reference-based relationship and one or more resources having a containment-based relationship; and

locking at least one resource of said plurality of resources using a locking strategy that depends on whether the determined relationship is a containment-based relationship or a reference-based relationship.

8. The at least one program storage device of claim 7, wherein said locking of said at least one resource is performed without locking at least one other resource of said plurality of resources.

9. The at least one program storage device of claim 7, wherein said locking of said at least one resource is further based on an operation to be performed.

10. The method of claim 3, wherein the operation comprises at least one of create, delete, read and write.

11. The method of claim 10, wherein the relationship is a containment-based relationship, wherein the at least one resource comprises a first resource and a second resource, the first resource referencing the second resource, and wherein the locking comprises write locking the first resource in order to create an instance of the second resource.

12. The method of claim 10, wherein the relationship is a containment-based relationship, wherein the at least one resource comprises a first resource and a second resource, the first resource referencing the second resource, and wherein the locking comprises write locking the first resource and the second resource in order to delete an instance of the second resource.

13. The method of claim 10, wherein the relationship is a containment-based relationship, wherein the at least one resource comprises a first resource and a second resource, the first resource referencing the second resource, and wherein the locking comprises read locking the second resource in order to read therefrom.

14. The method of claim 10, wherein the relationship is a containment-based relationship, wherein the at least one resource comprises a first resource and a second resource, the first resource referencing the second resource, and wherein the locking comprises write locking the second resource in order to write thereto.

15. The method of claim 10, wherein the relationship is a reference-based relationship, wherein the at least one resource comprises a first resource and a second resource, the first resource referencing the second resource, and wherein the locking comprises write locking the first resource in order to delete the first resource.

16. The method of claim 10, wherein the relationship is a reference-based relationship, wherein the at least one resource comprises a first resource and a second resource, the first resource referencing the second resource, and wherein the locking comprises write locking the first resource in order to create an instance of the second resource.

17. The method of claim 10, wherein the relationship is a reference-based relationship, wherein the at least one resource comprises at least one instance of a first resource and a second resource, at least one of the at least one instance of the first resource referencing the second resource, and wherein the locking comprises write locking the at least one of the at least one instance of the first resource in order to delete the second resource.

18. The method of claim 10, wherein the relationship is a reference-based relationship, wherein the at least one resource comprises a first resource and a second resource, the first resource referencing the second resource, and wherein the locking comprises read locking the first resource and the second resource in order to read the second resource.

19. The method of claim 10, wherein the relationship is a reference-based relationship, wherein the at least one resource comprises at least one instance of a first resource and a second resource, at least one of the at least one instance of the first resource referencing the second resource, and wherein the locking comprises read locking at least one of the at least one instance of the first resource and write locking the second resource in order to write to the second resource.

20. The method of claim 10, wherein the relationship is a referenced-based relationship, wherein the at least one resource comprises a first resource, a second resource and a third resource, the first resource and the second resource referencing the third resource, and

wherein the locking comprises read locking one of the first resource and the second resource and write locking the third resource in order to write to the third resource.

21. The method of claim 1, wherein the determining comprises employing a set of policies.

22. The method of claim 1, wherein the at least one resource comprises at least one of a table and a directory.

23. The system of claim 4, wherein the operation comprises at least one of create, delete, read and write.

24. The system of claim 23, wherein the relationship is a containment-based relationship, wherein the at least one resource comprises a first resource and a second resource, the first resource referencing the second resource, and wherein the means for locking comprises means for write locking the first resource in order to create an instance of the second resource.

25. The system of claim 23, wherein the relationship is a containment-based relationship, wherein the at least one resource comprises a first resource and a second resource, the first resource referencing the second resource, and wherein the means for locking comprises means for write locking the first resource and the second resource in order to delete an instance of the second resource.

26. The system of claim 23, wherein the relationship is a containment-based relationship, wherein the at least one resource comprises a first resource and a second resource, the first resource referencing the second resource, and wherein the means for locking comprises means for read locking the second resource in order to read therefrom.

27. The system of claim 23, wherein the relationship is a containment-based relationship, wherein the at least one resource comprises a first resource and a second resource,

the first resource referencing the second resource, and wherein the means for locking comprises means for write locking the second resource in order to write thereto.

28. The system of claim 23, wherein the relationship is a reference-based relationship, wherein the at least one resource comprises a first resource and a second resource, the first resource referencing the second resource, and wherein the means for locking comprises means for write locking the first resource in order to delete the first resource.

29. The system of claim 23, wherein the relationship is a reference-based relationship, wherein the at least one resource comprises a first resource and a second resource, the first resource referencing the second resource, and wherein the means for locking comprises means for write locking the first resource in order to create an instance of the second resource.

30. The system of claim 23, wherein the relationship is a reference-based relationship, wherein the at least one resource comprises at least one instance of a first resource and a second resource, at least one of the at least one instance of the first resource referencing the second resource, and wherein the means for locking comprises means for write locking the at least one of the at least one instance of the first resource in order to delete the second resource.

31. The system of claim 23, wherein the relationship is a reference-based relationship, wherein the at least one resource comprises a first resource and a second resource, the first resource referencing the second resource, and wherein the means for locking comprises means for read locking the first resource and the second resource in order to read the second resource.

32. The system of claim 23, wherein the relationship is a reference-based relationship, wherein the at least one resource comprises at least one instance of a first resource and a second resource, at least one of the at least one instance of the first resource referencing the second resource, and wherein the means for locking comprises means for read locking at least one of the at least one instance of the first resource and write locking the second resource in order to write to the second resource.

33. The system of claim 23, wherein the relationship is a referenced-based relationship, wherein the at least one resource comprises a first resource, a second resource and a third resource, the first resource and the second resource referencing the third resource, and wherein the means for locking comprises means for read locking one of the first resource and the second resource and write locking the third resource in order to write to the third resource.

34. The system of claim 4, wherein the means for determining comprises means for employing a set of policies.

35. The system of claim 4, wherein the at least one resource comprises at least one of a table and a directory.

36. The at least one program storage device of claim 7, wherein the operation comprises at least one of create, delete, read and write.

37. The at least one program storage device of claim 36, wherein the relationship is a containment-based relationship, wherein the at least one resource comprises a first resource and a second resource, the first resource referencing the second resource, and wherein the locking comprises write locking the first resource in order to create an instance of the second resource.

38. The at least one program storage device of claim 36, wherein the relationship is a containment-based relationship, wherein the at least one resource comprises a first resource and a second resource, the first resource referencing the second resource, and wherein the locking comprises write locking the first resource and the second resource in order to delete an instance of the second resource.

39. The at least one program storage device of claim 36, wherein the relationship is a containment-based relationship, wherein the at least one resource comprises a first resource and a second resource, the first resource referencing the second resource, and wherein the locking comprises read locking the second resource in order to read therefrom.

40. The at least one program storage device of claim 36, wherein the relationship is a containment-based relationship, wherein the at least one resource comprises a first resource and a second resource, the first resource referencing the second resource, and wherein the locking comprises write locking the second resource in order to write thereto.

41. The at least one program storage device of claim 36, wherein the relationship is a reference-based relationship, wherein the at least one resource comprises a first resource and a second resource, the first resource referencing the second resource, and wherein the locking comprises write locking the first resource in order to delete the first resource.

42. The at least one program storage device of claim 36, wherein the relationship is a reference-based relationship, wherein the at least one resource comprises a first resource and a second resource, the first resource referencing the second resource, and wherein the locking comprises write locking the first resource in order to create an instance of the second resource.

43. The at least one program storage device of claim 36, wherein the relationship is a reference-based relationship, wherein the at least one resource comprises at least one instance of a first resource and a second resource, at least one of the at least one instance of the first resource referencing the second resource, and wherein the locking comprises write locking the at least one of the at least one instance of the first resource in order to delete the second resource.

44. The at least one program storage device of claim 36, wherein the relationship is a reference-based relationship, wherein the at least one resource comprises a first resource and a second resource, the first resource referencing the second resource, and wherein the locking comprises read locking the first resource and the second resource in order to read the second resource.

45. The at least one program storage device of claim 36, wherein the relationship is a reference-based relationship, wherein the at least one resource comprises at least one instance of a first resource and a second resource, at least one of the at least one instance of the first resource referencing the second resource, and wherein the locking comprises read locking at least one of

the at least one instance of the first resource and write locking the second resource in order to write to the second resource.

46. The at least one program storage device of claim 36, wherein the relationship is a referenced-based relationship, wherein the at least one resource comprises a first resource, a second resource and a third resource, the first resource and the second resource referencing the third resource, and wherein the locking comprises read locking one of the first resource and the second resource and write locking the third resource in order to write to the third resource.

47. The at least one program storage device of claim 7, wherein the determining comprises employing a set of policies.

48. The at least one program storage device of claim 7, wherein the at least one resource comprises at least one of a table and a directory.

* * * * *